

# Civil and Environmental Engineering

---

## Department Information

- **Interim Department Chair:**  
Achintya Bezbaruah, Ph.D.
- **Graduate Program Coordinator:**  
Kalpana Katti, Ph.D.
- **Department Location:**  
201 Civil and Industrial Engineering Bldg.
- **Department Phone:**  
(701) 231-7244
- **Department Web Site:**  
[www.ndsu.edu/ccee/](http://www.ndsu.edu/ccee/) (<http://www.ndsu.edu/ccee/>)
- **Application Deadline:**  
February 15 for fall admission; September 15 for spring admission
- **Credential Offered:**  
Ph.D., M.S.
- **English Proficiency Requirements:**  
TOEFL iBT 71, IELTS 6; Duolingo 105

## Master of Science

The Master of Science degree is a Plan A - Master's Thesis option. This format emphasizes research, the ability to analyze and interpret data, and to prepare a scholarly thesis. The student and adviser develop a program of study consisting of at least 30 credit hours of graduate level material to meet individual educational goals. A cumulative GPA of 3.0 or better is required. An oral defense of the research-based thesis is required.

## Accelerated Master's Program

### Curriculum for the Accelerated (4+1) program

Code	Title	Credits
<b>*Required Courses</b>		<b>12</b>
Management/Business/Communication		5
MGMT 630	Leadership in Organization	
CE 740	(**)	
CE 757	Pavement Evaluation and Rehabilitation (**)	
CM&E 603	Scheduling and Project Control	
CM&E 660	Infrastructure Management	
COMM 711	Communication Theory	
COMM 782	Theories of Persuasion	
MIS 770	Information Resources Management	
NRM 702	Natural Resources Management Planning	
Engineering Tool		6
CE 641	Finite Element Analysis	
CE 739	Computational Methods for Engineering (**)	
ENGR 729	Machine Learning for Engineers	
GEOG 665	Remote Sensing of the Environment	
IME 661	Quality Assurance and Control	
IME 662	Total Quality In Industrial Management	
IME 663	Reliability Engineering	
IME 765	Data Analysis	
ME 711	Advanced Engineering Analysis	
STAT 661	Applied Regression Models	
STAT 726	Applied Regression and Analysis of Variance	
CE 790	Graduate Seminar	1

CE 798	Master's Thesis	6
<b>*Focus Area Courses - Select at least 12 credits from one of the following focus areas.</b>		<b>12</b>
<b>Focus Area 1 - Civil Infrastructure</b>		
Structure		
CE 611	Design of Pre-stressed Concrete	2
CE 625	Bridge Evaluation and Rehabilitation	3
CE 630	Timber and Form Design	3
CE 645	Advanced Steel Design	2
CE 646	Basic Dynamics of Structures	3
CE 647	Stability of Structures	3
CE 720	Continuum Mechanics	3
CE 793	Individual Study/Tutorial (Deep Learning for Engineers)	2
CM&E 665	Bridge Engineering and Management	3
Transportation		
CE 619	Pavement Design	3
CE 652	Fundamentals of Oil & Gas Pipeline: Design, Operation, Inspection & Maintenance	3
CE 654	Geometric Highway Design	3
CE 656	Railroad Planning and Design	3
CE 782	Introduction to Intelligent Infrastructure	3
Geotechnical		
CE 617	Slope Stability and Retaining Walls	3
CE 661	Foundation Engineering	3
CE 662	Designing with Geosynthetics	2
CE 663	Geotechnical Earthquake Engineering	3
CE 664	Advanced Soil Mechanics	2
<b>Focus Area 2 - Water Environmental</b>		
Environmental		
CE 610	Water & Wastewater Engineering	3
CE 671	Environmental Nanotechnology	3
CE 672	Solid and Hazardous Waste Management	3
CE 673	Air Pollution	3
CE 679	Advanced Water and Wastewater Treatment	3
CE 790	Graduate Seminar (Small Community Water Supply and Sanitation)	3
CE 696	Special Topics (Environmental Engineering Design)	3
Water Resources		
CE 621	Open Channel Flow	3
CE 674	Groundwater Sustainability Design	3
CE 676	Watershed Modeling	3
CE 677	Applied Hydrology	3
CE 776	Ground Water and Seepage	3
CE 793	Individual Study/Tutorial (Advanced Fluid Mechanics)	3

\* The above course list will be updated as new courses are considered or to be offered.

\*\* Courses can be taken either in Category A or B but cannot be double counted.

\*\*\* Courses to be developed when the program starts.

## Doctor of Philosophy

The Doctor of Philosophy degree requires 90 credits beyond the baccalaureate degree in civil engineering with a cumulative GPA of 3.0 or higher (60 credits beyond an M.S. degree in Civil Engineering or a sub-area of Civil Engineering) for graduation. A dissertation supervisory committee should be formed and a plan of study be filed by the end of first year of study. A minimum of 30 hours of additional course work chosen by the student and the supervisory committee from appropriate existing Civil Engineering graduate courses, new courses, and courses outside the department must be completed.

An M.S. degree from another institution may substitute for up to 30 credits of the 90 credits required; however, suitability of transfer or use of courses and research credits in the plan of study would be decided by the adviser and supervisory committee.

A comprehensive preliminary examination is administered after completion of the greater portion of the course work. The committee chair will coordinate the examination. The format and duration will be determined by the committee. The student will present a research proposal within one year after the preliminary examination. A minimum of 30 and a maximum of 40 credit hours can be earned for research, preparation, and defense of a dissertation in Civil Engineering. A minimum of 12 credit hours in a minor or cognate area as deemed appropriate by the student and the supervisory committee may be completed by the student. The student will defend the dissertation in a final examination attended by the supervisory committee members and other academics.